Calibration

Testbeam E(e) = e

E(pi) = e f0 + h(1-f0)

pi/e=f0 + h/e(1-f0)

pi/e->1 f0->1 (E->infinity)

if e/h ~ 1.4 f0~1/2 (low energy)

pi/e~0.33+0.66(1/1.4)

~0.8

(ECAL has bigger pi/h - see NIM paper)

Min Bias <Pt>~0.6 GeV -> we need low energy calibration

-> more testbeam

P~0.6 GeV HB

P<~6.0 GeV HC

P<~60 GeV HF

-> pi/e effects are large - must correct

scalar ET min bias

<Pt>~0.6 GeV

rho ~ 6 +- particles/rapidity

-> 9 pi/rapidity

scalar_ET_minbais_eta<5 = 0.6*11*9=54 GeV

for 20 mion bias -> 1080 GeV

sigma ~ 100% * sqrt(scalar_et) ~ 30 GeV

20% pi/e -> 200 GeV - dominates

Tower Occupancy

HCAL ~ 0.087x1/72 -> 11x72=800 cells/rapidity

rho ~ 9 pi/rapidity x 20 min bias -> 180 -> 120 are pi+-

-> ~7 HCAL cells/pi+-

ECAL is 25 times finer grained and only has pi_0 (toughly)

-> ~` 340 cells ECAL/pi_0

-> ECAL is sparse even at the highest luminosity

-> use ECAL to “calibrate”

presently ECAL set linear for e/gamma

HCAL set for 300 geV pi in the HCAL only (test beam) -> large minbias mismeasure

calib scheme

a) look for ET>ET0 in ECAL tower (ET0 ~` 0.5 GeV?

calculate rms in 5x5 (5x5 occupancy ~0.003x25=0.075)

if “narrow”, take 5x5 ECAL = E at Tower

if “wide” take 5x5 ECAL+HCAL

zero energy in 5x5 ECAL plus HCAL

b) look for ET>ET1 in HCAL tower (0.5 GeV)

there is ~ no energy in ECAL from a)

sum HCAL in 3x3

assing E to central tower

Erase 3x3

result

this plan is to assign pi0,pi+- angles using ecal towers if int in ECAL. Energy of pi0 from ECAL. Energy of pi+- using 2 different effective e/h - interacting in Ecal, and no ECAL interactions.